Remarks

Claims 1 and 6 have been amended to recite that the range of O is 0.0049% to 0.0008%. The new range is inherently encompassed by the original range. However, the new lower number is directly supported in Table 1 at Steel C.

Claims 2 and 7 have been amended to delete the presence of V.

Entry of the above changes into the official file is respectfully requested.

Claims 1, 2, 6 and 7 stand rejected under 35 USC §103 over Yoshii for the reasons set forth in the July 8, 2009 Official Action.

Claims 3 and 8 stand rejected under 35 USC §103 over the combination of Fujita with Yoshii for the reasons set forth in the July 8, 2009 Official Action.

Claims 1-3 and 6-8 stand rejected under 35 USC §103 over Fujita for the reasons set forth in the July 8, 2009 Official Action.

The Applicants respectfully submit that all of the solicited claims are allowable for the reasons set forth in detail below.

The general differences are shown in the attached Comparison Table as Exhibit 1. Thus, those skilled in the art can readily see, in a simplified form, the large differences between the subject matter of the solicited claims versus Yoshii and Fujita. Such differences are fully illustrated in Exhibit 2 which includes Tables 1-1 and 1-2. More discussion of those Tables follows.

The columns in yellow represent values outside the range of Claim 1. Further, the columns in pink indicate values outside the ranges of Claims 1 and 6. Examples which satisfy Claims 1 and 6 are not found in Yoshii and Fujita. In particular, the examples of Yoshii and Fujita are outside the claimed ranges of C and Ti.

More specifically, the entirety of the examples of Yoshii are outside the ranges of C, Nb and Ti of Claims 1 and 6. Also, the entirety of the examples of Fujita are outside the ranges of C, Ti, Cr, Mo and Ceq specified in Claims 1 and 6.

As set out in the Applicants' English specification on page 7, in paragraph [0023], C is an element necessary for securing fatigue endurance after quenching. However, at a C content of less than 0.18%, it is difficult to secure the desired fatigue endurance, while at a C content exceeding 0.29%, resistance for hydrogen embrittlement degrades. Further, as set forth in the Applicants' specification on page 13, in paragraph [0044], when the carbon equivalent is less than 0.4, the desired hardening penetration and fatigue endurance cannot be obtained.

The reason for the foregoing is that the technical fields and objects of Yoshii and Fujita are dissimilar from those of the Applicants, and it is difficult to arrive at devising Claims 1 and 6 of the present application even by combining the arts of the two cited documents.

According to Claims 1 and 6, it is important to control Ceq and the total of x of multiplying factors according to Grossman to be within their specified ranges in addition to the control of the chemical composition of each element to be within each of their specified ranges.

On the other hand, in Yoshii and Fujita, there are no disclosures of (b) Ceq and (c) the total of x of multiplying factors according to Grossman et al. To demonstrate this, the amounts of the compositions of 51 examples of Yoshii and the compositions of 18 examples of Fujita, in terms of Ceq and χ factor, were calculated. However, none of the examples satisfied the ranges specified in Claims 1 and 6. Comparisons between Claims 1 and 6 and the examples of Yoshii and Fujita are shown in attached Tables 1-1 and 1-2. Columns in yellow and pink therein exhibit values which are outside the range of Claims 1 and 6.

From the foregoing discussion and Exhibits 1 and 2, it can be seen that the steels of the Applicants are quite different from those of Yoshii and Fujita and that both references, whether taken individually or collectively, fail to disclose, teach or suggest the claimed subject matter.

With respect to the Applicants' claimed amount of O, namely, 0.0049% to 0.0008%, it can be seen that neither Fujita nor Yoshii provide any teachings in that regard. This was acknowledged in the July 8, 2009 Official Action wherein the rejection based on Yoshii acknowledges that O is "not taught" in the Comparative Table on page 4 and further acknowledged in the body of the rejection as follows: "With regard to oxygen content, Yoshii et al. do not teach that oxygen is present; therefore, it will be regarded as being absent (i.e., 0 mass %) from the alloy."

Similarly, Fujita is acknowledged in that Official Action as not disclosing or discussing O at all. In that regard, on page 7, Fujita in the table acknowledges that O is "not taught." Similarly, the text in the rejection recites "with regard to oxygen content, Fujita et al. do not teach that oxygen is present; therefore, it will be regarded as being absent (i.e., mass %) from the alloy."

Given those explicit acknowledgements and the actual failure of Yoshii and Fujita to have any disclosure with respect to the amount of O, the Applicants respectfully submit that both disclosures are nonenabling with respect to a specifically claimed aspect in independent Claims 1 and 6. The Applicants specifically claim 0.0049% to 0.008% of O. There is no disclosure in Yoshii and Fujita with respect to O and both references are therefore nonenabling and not available as prior art for a rejection against those claims. As a consequence, both references, whether taken individually or collectively, are inapplicable.

The Applicants thus respectfully request that all three rejections based on Yoshii alone, Fujita alone and the combination of Fujita with Yoshii, be withdrawn.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,

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